195 - LEVELS OF BODY COMPOSITION OF PRESCHOOL CHILDREN FROM THE PRIVATE SYSTEM OF EDUCATION IN THE CITY OF BARBALHA-CE, BRAZIL

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INTRODUTION:

The necessity of studies involving population surveys, mainly among children and teenagers, had an important increase in latest years. Studies which involve anthropometrical assessment, especially body mass and stature, have been the most used method to evaluate nutritional condition and the regulation of growth in children and teenagers, and also through this method, detect cases of sub nutrition or early obesity (WHO, 2002). These studies have given significant contribution for the society, once it can verifies the present individual's conditions and also to get suggestions to change the lifestyle and advances in the areas related to health. The concern with the study of body composition seems to have support in the increasing of prevalence of obesity around the world.

As Lohman cited by Lopes; Pires Neto (1999), the body composition in children and youths are changing in a not favorable direction. The children are more obese than in 20 years ago. The changes in the standards of physical activity and nutrition nowadays are responsible for this change. Such affirmation corroborates with the data told by Alves (2003), that it evidenced an expressive increase in the incidence of obesity in Brazilian's children above two years old. This fact was also confirmed in the United States, where the Pediatric Nutrition Surveillance System, had demonstrated that in the period from 1989 to 1997 the ratio of obesity in American children from 2 to 4 years increased from 7% to 8,6%.

In this direction, the scientific community is alerting the society to the risks of cardiovascular illnesses and others complications for the health of boys and girls who exceed, respectively, of 25% and 30% of relative body fat. Children, with relative body fat above of these values, present higher arterial blood pressure, both systolic and diastolic, elevated total cholesterol and the relation of the level of low density lipoprotein (LDL), with high density lipoprotein (HDL). On the other hand, standards of very low fat, less than 10% of the total corporal mass, can be associates to malnutrition (WILLMORE; COSTILL, 2001).

As a form to prevent all these problems, the incentive to the adoption of a more active lifestyle of and a healthful feeding become necessary, beginning with the care with the preparation of foods in both, nutritional aspect and hygienic-sanitary conditions. The family, the school and the society have the responsibility in favor of the adoption of a behavior capable to find feeding balance to reach a better quality of life to the children. For the health professionals it is up, beyond the accompaniment, the orientation about the preparation and hygiene of foods, assessment of the feeding to the growth and development of the children, and implementation of educative programs on nutrition and physical activity, either in the schools or in the community.

Understanding that the adoption of a healthful feeding behavior in preschool e schoolchildren can be pointed as important way to promotion health, with positive repercussions to the adult life; that the nutritional assessment intervenes directly at the learning process in children and that the nutritional monitoring in this social environment is important to evaluate, to treat and to prevent the risks for children's health and nutrition, is that came up the interest in developing this study at Nossa Senhora de Fátima school, a private school of Barbalha-Ce, which is developing a project of nutritional education since the beginning of the year of 2006, stimulating the adoption of healthful feeding habits for children on their Education.

The project was implanted from the claims of some parents who had looked for school aid in the direction to develop actions to make possible one better quality of life to their children. The introduced actions are: the adoption of a healthful snack, with natural food, forbidden fried food, soft drinks and savories at the school meal; the bringing up the "day of the fruit", where all the children can only bring for snack fruits that are enjoyed collectively; and also an action that has been carried out through theater plays that have as aim to promote the feeding education, alerting the children for not eat foods that are harmful to their health.

From the knowledge of this assignment developed in the school, it was objectified to carry out an accompaniment of the levels of children's body composition at preschool phase, in the direction to verify the results gotten with the project, once it becomes necessary to recognize that the assignment developed in the school must be strengthened at home, what may bring an improvement on the health's conditions to the children and to their family. This way, the objective of this study consists of analyzing the levels of body composition by means of different techniques of analysis in children at preschool phase, to esteem health conditions. The obesity level is a variable that are possible to be measured by several techniques. Its assessment can be through the use of protocols and tables praised on literature. The body Mass index, the percentage of body fat, the relation weight/stature and measures of circumference present a frequent number of studies (OF NEVES et al. 2001; YOU WOULD MAKE; SALVADOR, 2005; SILVA et al. 2005;). The children's obesity presents some difficulties in its classification, in special due to the process of development which are the children at preschool age. This form, it becomes necessary a better identification of the body composition in this ages.

METHODOLOGY:

The present study was characterized as cross sectional, descriptive and case study. The population was composed by schoolchildren from 02 to 07 years old , of both genders, registered and regularly frequenting the children's education of the Nossa Senhora de Fátima School, belonging to the private school chain of education in the city of Barbalha - CE. The school has a total of 125 children registered at children's school , whose parents had received the Term from Free Assent to authorize the participation of the children in the research. In this universe the participation of 51 preschool was authorized, being 28 male and 23 female, that became the sample of this study.

For the assessment of the obesity level, they had been used as instruments an electronic Filizola (100g) scale to the verification of body mass and for stature, a one estadiômetro Sanny (trena with 200 cm, a precision of 01 mm). In children up to 5 years the calculation of ideal weight in relation to height of the National Health Statistics Center will be (1986) cited by Barbosa (2004) was used, whereas for age above 6 years old was used the body mass index of Must; Dallal; Dietz (1991) cited by Barbosa (2004); Both proposals used similar classificatory references which allowed the classification of the group as a whole. For measures of skin folds (biceps, triceps, to sub scapular and supra iliac) one adipômetro of the Sanny brand and it was verified the average the thicker skin fold in millimeters, and the determination of the percentage of fat occurred through the formula of Duremberg et (1990). The plan of analysis of the data used statistical program SPSS version 13.0 for descriptive and inferencial statistics, with level of significance of 0,01 and 0,05 established by the tests of correlation of pearson and comparison of average of independent groups t of student.

RESULTS AND DISCUSSION:

The results of the study considering the obesity degree allowed to evidence that 58.8% of the evaluated children are inside of the band of normal ratios between body mass and stature, 23.5% are overweight, 15.7% in the obesity band and 2% are out (the minor) of the classificatory limits data for the referential author suggesting that these children are below the normal weight (table nº 01).

Tabela nº 01. Freqüência e percentual do grau de obesidade: Grupo total.

	Frequency	Percent
Low weight	1	2,0
Obese	8	15,7
Overweight	12	23,5
Eutrofic	30	58,8
Total	51	100,0

Giugliano; Melo (2004) corroborates this study showing equivalence between the values of low weight (2% X 2.8%), a higher trend for the occurrence of the eutrofic level (58.8% X 77.1%) and a lesser percentage for overweight (23.5% X 14.6%) and obesity(15.7% X 5.5%).

In an analysis divided by sex, the percentile differences between the studies still the same. In the male occur lower values in the study carried out in the eutrofic level (53.6% X 78%), higher in the levels of overweight (21.4% X12.9%) and obesity (21.4% X 5.9%) and equivalence in the percentile values of low weight (3.6% X 3.1%). The table nº 02 explains the values found in this research.

Tabela nº 02. Freqüência e percentual do grau de obesidade: Grupo masculino.

	Frequency	Percent
Low weight	1	3,6
overweight	6	21,4
Obese	6	21,4
Eutrofic	15	53,6
Total	28	100,0

Comparing the results presented by the female children, in this study, it was found more reduced values in the eutrofic level (65.22% X 76.2%) and low weight (not identified X 2.6%). The levels of overweight and obese are higher in the female studied group (26.09% X 16.1% and 8.7% X 5.1%, respectively). The table nº 03 points the results of the girls, and the graph A illustrates the pertinent data to the stratification given on the tables.

Tabela nº 03. Freqüência e percentual do grau de obesidade: Grupo feminino.

	Frequency	Percent
obese	2	8,7
overweight	6	26,1
eutrofic	15	65,2
Total	23	100,0

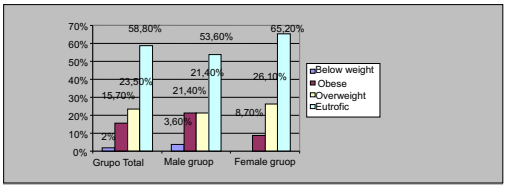


Gráfico A. Percentual do grau de obesidade.

In total numbers these results find accord with the one found for Silva et al (2003) that point a prevalence of 22,6% of overweight and 11.3% of obese in preschool children that studies in private schools. For male, such similarity does not happen comparing to the carried out study, being to the values in 17,6% of overweight and 13% of obese. For female the values found are sufficiently similar with 27% overweight and 9.8% obese.

Although Tritschler (2003) affirms that the Body mass index (BMI) a more prone method to errors when used in children than in adults, its uses allows to compare and correlates with the percentage of body fat and others techniques. The assessment of the body composition supplies given relative data to the amount of the main structural components of the body: muscles, bones, fats, tissues and residual substances, whose addition is equal to the total body weight. (FRANCE, 1998). In this study, it was tried to give approach to the relative amount of body fat - percentile of fat - for its relation with health risks. One becomes important to observe the standards of accumulation of fat in the diverse areas of the body.

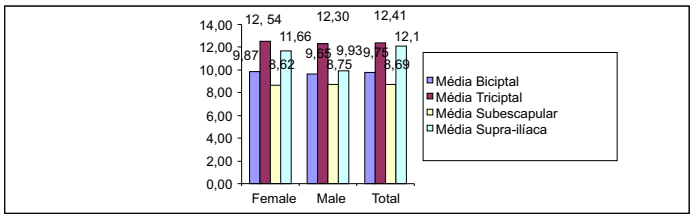
Daniels et al. (1999) in his study about the association of cardiovascular risks factors and distribution of body fat in children and teenagers had evidenced that the distribution of regional fat is more important to correlate cardiovascular risks factors than the percentage of total fat. The above authors had found that, the relative superiority of central fat deposits, standard android, are associated with a favorable profile of lipids concentrations and plasmatic lipoproteins, arterial blood pressure and left ventricular mass, being able to predispose a higher risk to development cardiovascular disease. The results found in the present study point the triceps and supra- iliac skin folds as being the places of higher predominance, on average, of body fat among the surveyed ones as for the complete group as in the analysis of sex (tables 04, 05 and 06), being the highest average values found in supra iliac and triceps in the female group. The graphical B standees out the values stratificated in the tables.

Tabela nº 04. Média de espessuras de dobras cutâneas:

Grupo total.	Mean	Std. Deviation	t	Sig. (2-tailed)
biceps	9,7471	3,81378	-,199 -,202	,843 ,841
triceps	12,4098	4,36602	-,190 -,194	,850 ,847
Sub scp	8,6882	4,59703	,099 ,102	,922 ,919
Supra iliac	10,7118	6,94327	-,883 -,914	,382 ,365

Grupo masculino	Mean	Std. Deviation
biceps	9,6500	4,12997
triceps	12,3036	4,79780
Subescapul	8,7464	5,31709
suprailiac	9,9321	7,93912
Grupo feminino	**Mean**	**Std. Deviation**
biceps	9,8652	3,47806
triceps	12,5391	3,87823
subescap	8,6174	3,64999
suprailiac	11,6609	5,52233
Valid N (listwise)		

Gráfico B. Média de espessuras de dobras cutâneas.



Giving continuation to this pertinent discussion was inquired the correlation between the percentage of fat found through the formula of Duremberg (1990) correlating this pointer with the values of the thickness of the used skin folds in this study. In such way the correlation index was used moment of Pearson (r) who presented good correlation with all the skin folds (table nº 08) for the complete group and elevated to the male group. For the female group it presented good correlation with the biceps and triceps folds and moderate with sub scapular and the supra iliac

Tabela nº 07. Correlação percentual de gordura e espessuras de dobras cutâneas:

Grupo completo (N=51)		**Dcbicipt (mm)**	**Dctricip (mm)**	**Dcsubesc (mm)**	**Dcsuprai (mm)**
Percgord	Pearson Correlation	0,841**	0,887**	0,806**	0,838**
	Sig. (2-tailed)	0,000	0,000	0,000	0,000
Grupo masculino (n=28)		**dcbicipt**	**dctricip**	**dcsubesc**	**dcsuprai**
percgord	Pearson Correlation	0,903**	0,927**	0,900**	0,914**
	Sig. (2-tailed)	0,000	0,000	0,000	0,000
Grupo feminino(n=23)		**dcbicipt**	**dctricip**	**dcsubesc**	**dcsuprai**
percgord	Pearson Correlation	0,810**	0,896**	0,766**	0,757**
	Sig. (2-tailed)	0,000	0,000	0,000	0,000

***p<0,05 Significant end **p>0,05 No Significant**

Such results indicate, that the distribution of the body fat needs to be treated as an indicator of accompaniment, being the superiority of accumulation in determined areas, an element which suggests a posterior classification in distribution gynoide or android. However for this age group such premise cannot be confirmed once the presented average values between the groups do not differ in a significant way.

From the analysis of the data accomplished in the present study one concludes that:

1 - The degree of obesity and overweight are high in the sample, in special in the male group;

2 - The distribution of body fat is not susceptible of classification in android and ginoide in this age band, but, can be followed, regard to its predominance in the body segments trunk and superior members;

3 - The predominance of body fat deposit is in the triceps and supra iliac areas in both the groups, presenting values a little bit higher in the female group;

4 - The percentage of fat presents a correlation with all the measured folds in the male group, however in the female group this association is higher for the triceps and supra iliac folds what it can suggest an initial trend for a higher accumulation of fat in the area of the trunk in the female group.

REFERÊNCIAS

ALVES, J. A. B. Atividade física em crianças: promovendo a saúde do adulto. **Revista Brasileira de Saúde Materno Infantil.** 31 (1): 5-6, 2003.

BARBOSA, V. L. P. **Prevenção da obesidade na infância e na adolescência:** exercício, nutrição e psicologia. Barueri-SP: Manole, 2004.

CDC. **Centers for Disease Control and Prevention.** Pediatric Nutrition Surveillance System Summary, 1997.

DANIELS S. R., MORRISON J. A., SPRECHER D. L. **Association of body fat distribution and cardiovascular risk factors in children and adolescents.** Circulation 1999; 99: 541-545.

FARIAS, E. S.; SALVADOR, M. R. D. Antropometria, composição corporal e atividade física de escolares. **Revista Brasileira de Cineantropómetria e Desempenho Humano.** 7 (1): 21-29, 2005.

FRANÇA N. M.; VIVOLO M. A. Avaliação antropométrica. In: MATSUDO V. K. R., editor. **Testes em Ciências do Esporte.** São Paulo: Burti; 1998. p. 9-31 18.

GIUGLIANO, R.; MELO, A. L. P. Diagnóstico de sobrepeso e obesidade em escolares: utilização do índice de massa corporal segundo padrão internacional. **Jornal de Pediatria**. Vol. 80, nº 2, 2004.

GUYTON, A.C.; HALL, J. E. **Tratado de fisiologia médica.** Rio de Janeiro: Guanabara Koogan, 1997.

LOPES, A. S; PIRES NETO, C.S. Antropometria e composição corporal das crianças com diferentes características étnicas: **Revista Brasileira de Cineantropometria e Desenvolvimento Humano.** 1 (1): 38-39, 1999.

SILVA, Gisélia Alves Pontes da et al . Overweight and obesity prevalence among preschool children of two private schools in Recife in the State of Pernambuco. **Revista Brasileira de Saude Materno Infantil**, Recife, v. 3, n. 3, 2003. Available from: <http://www.scielo.br/scielo.php?script=sci_arttext&pid=S151938292003000300011&lng=en&nrm=iso>. Access on: 08 Oct 2006. doi: 10.1590/S1519-38292003000300011.

WHO. **Whold Health Organization.** Howmuch physical activity needed to improve and maintain health. [periódico oline], 2002. Disponível em <http://www.who.int/hpt/physactiv/p.a.how.much.shtml > [2002 dez 03].

WILMORE, J.H; COSTILL, D.L. **Fisiologia do esporte e do exercício.** 2 ed. São Paulo: Manole, 2001.

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LEVELS OF BODY COMPOSITION OF PRESCHOOL CHILDREN FROM THE PRIVATE SYSTEM OF EDUCATION IN THE CITY OF BARBALHA-CE, BRAZIL

SUMMARY

The body composition (BC) is a parameter that subsidizes the attendance in stage of development and growth of an individual a long one's life. The objective of this study is to analyze the levels of body composition in preschool children. The sample was composed by 51 children, at the age from 2 to 7 years old in the city of Barbalha - CE, submitted to body mass (kg), stature (cm)

and skin folds (mm) measures at the biceps, triceps, to sub scapular and supra-iliac areas and perimetria (cm) of the arm, fist, abdomen, hip, thigh and calf from both sides, right and left. For the analysis of the data was used statistical program SPSS version 13.0 for descriptive and inferencial statistics, with level of 5% of significance. The results had demonstrated that 58.8% of the evaluated children are normal weight, 23.5% are overweight, 15.7% obese and 2% are below the normal weight. Among male children, 53.6% are normal weight, 21.4% obese and overweight, and 3.6% are below the normal weight. Among female ones, 65.22% are with the normal weight, 26.09% are overweight and 8.7% are obese. In relation to the distribution of regional fat, one evidenced that the triceps folds and supra-iliac are the areas of higher predominance of body fat among the surveyed ones, as much for the complete group as to the analysis of genders, being the highest average values found at the female group. **Conclusion:** The degree of obesity and overweight are high in the sample, in special in the male group; the predominance of deposit of body fat at the triceps and supra- iliac areas in both the gender, presents higher values in the female group, what one can suggest an initial trend for a higher accumulation of fat in the areas of the trunk, being it future indicator of cardiac risk.

Key-words: assessment, body composition, preschool

NIVEAUX DE COPOSITION CORPOREL DÊS ENFANTS EM PHASE PRÉ-SCOLAIRE DE L'ENOCIGNEMENT PRIVE DE BARBALHA-CE

Résumé: La composition corporelle est um paramétre qui accompagne lê développement et la croissance de l'individu tout au long de la vie. L'**objeetif** de cette étude est d'analiser les niveaux de composition corporel dês enfants pré-scolaire. L'échantillon a été composé par 51 enfants, entre 2 et 7 ans, de la ville de Barbalha - CE, soumis à des mesures de masse corporel (Kg), de stature (cm), dês plio entranés dês régions dês bíceps, tríceps, sous-scapulaire, de la hanche, et du périmétre (cm) du brás, du poignet, de l'abdomen, de la hanche, de la cuisse (et du ventre) des côtes drout et ganche. L'analyse dês donnés a utilisé le programme statistique SPSS version 13.0 pour une statistique descriptive et inférenciele arce un niveau d'importance de 5%. Les résultats out démontré que 58,8% dês enfants out arce poids normal, 23,5% sont en surpords, 15,7% sont obéses et 2% sont en-dessous du ponds normal. Entre lês enfants de sexe masculus 53,6% out um poids normal, 21,4% sont obéses ou en surpoids et 3,6% sont en dessous du poids normal. Pour ceus de sexe féminin, 65,22% out um poids normal, 26,09% sout em sur poids et 8,2% sout obéses. En relation à la distribuition de graisse locale, on a constaté que les plis du tríceps et de la hanche sont les endrorts ou predominent la graisse corporel tant pour lê groupe au complet que pour chaque genre, lês plus grandes valens étant rencontrécs dans lê groupe feminine. **Conclusion**: le dégré d'obésité et de surpords est élevé dans l'échantillon, opécialement dans lê groupe masculine ; la predominace de dépot de graisse corporel se trouve dans lês régrons du tríceps et de la hanche, lês valens étant an per plus élevés dans lê groupe féminen, ce qui suggire une tendance inicial à l'accumulation de graisse dans la région du tronc, ceci étaut un indicateur de futurs risques cardiaques.

Mots-Clés: évaluation, composition corporel, pré-scolaire

NIVELES DE LA COMPOSICIÓN DEL CUERPO DE NIÑOS PREESCOLARES DEL SISTEMA PRIVADO DE LA EDUCACIÓN EN LA CIUDAD DE BARBALHA-CE, EL BRASIL

RESUMEN: La composición del cuerpo (A.C.) es un parámetro que subvenciona la atención en la etapa del desarrollo y del crecimiento de un individuo un largo su vida. El objetivo de este estudio es analizar los niveles de la composición del cuerpo en niños preescolares. La muestra fue compuesta por 51 niños, en la edad a partir del 2 a 7 años de viejo en la ciudad de Barbalha - CE, sometida a la masa del cuerpo (kilogramo), estatura (centímetro) y las medidas en el bíceps, tríceps de los dobleces de la piel (milímetro), de sub las áreas y el perimetria scapular y supra-ili'acos (centímetro) del brazo, del puño, del abdomen, de la cadera, del muslo y del becerro de ambos lados, la derecha y a la izquierda. Para el análisis de los datos estaba la versión estadística usada 13.0 del programa SPSS para la estadística descriptiva e inferencial, con el nivel de el 5% de significación. Los resultados habían demostrado que 58.8% de los niños evaluados son peso normal, 23.5% son gordos, 15.7% obesos y los 2% están debajo del peso normal. Entre los niños masculinos, 53.6% son el peso normal, 21.4% obesos y gordos, y 3.6% están debajo del peso normal. Entre hembra unas, 65.22% están con el peso normal, 26.09% son gordos y 8.7% son obesos. En lo referente a la distribución de la grasa regional, una evidenció que el tríceps dobla y supra-ili'acas son las áreas de un predominio más alto de las grasas de cuerpo entre examinadas, tanto para el grupo completo en cuanto a el análisis de géneros, siendo los valores medios más altos encontrados en el grupo femenino. Conclusión: El grado de obesidad y el exceso de peso son altos en la muestra, en especial en el grupo masculino; el predominio del depósito de las grasas de cuerpo en el tríceps y de las áreas ilíacas supra- en ambos el género, valores más altos de los presentes en el grupo femenino, qué uno puede sugerir una tendencia inicial para una acumulación más alta de la grasa en las áreas del tronco, siendo él indicador futuro del riesgo cardiaco.

Palabras claves: gravamen, composición del cuerpo, pre-entrenamiento.

NÍVEIS DE COMPOSIÇÃO CORPORAL DE CRIANÇAS NA FASE PRÉ-ESCOLAR DA REDE PARTICULAR DE ENSINO DA CIDADE DE BARBALHA-CE, BRASIL.

RESUMO:

A composição corporal (CC) é um parâmetro que subsidia o acompanhamento de etapa de desenvolvimento e crescimento do indivíduo ao longo a vida. O **objetivo** deste estudo é analisar os níveis de composição corporal em crianças pré - escolares. A **amostra** foi composta por 51 crianças, na faixa etária de 2 a 7 anos da cidade de Barbalha - CE, submetidas às medidas de massa corporal (kg), estatura (cm), dobras cutâneas (mm) das regiões bicipital, tricipital, subescapular e supra-ilíaca e perimetria (cm) do braço, punho, abdôme, quadril, coxa e panturrilha dos lados direito e esquerdo. A **análise dos dados** utilizou programa estatístico SPSS versão 13.0 para estatística descritiva e inferencial, com nível de 5% de significância. Os resultados demonstraram que 58,8% das crianças avaliadas encontram-se com peso normal, 23,5% estão com sobrepeso, 15,7% na faixa de obesidade e 2% encontram-se abaixo do peso normal. Entre as crianças do sexo masculino, 53,6% estão com peso normal, 21,4% obesas e com sobrepeso e 3,6% está abaixo do peso. Nas do sexo feminino, 65,22% estão com o peso normal, 26,09% com sobrepeso e 8,7% estão obesas. Em relação à distribuição de gordura regional, constatou-se que as dobras tricipital e supra-ilíaca são os locais de maior predominância de gordura corporal entre os aferidos, tanto para o grupo completo quanto na análise por gênero, sendo os maiores valores médios encontrados no grupo feminino. **Conclusão:** O grau de obesidade e sobrepeso encontra-se elevados na amostra, em especial no grupo masculino; a predominância de depósito de gordura corporal encontra-se nas regiões triciptal e supra-ilíaca em ambos os sexos apresentando valores um pouco mais elevados no grupo feminino, o que pode sugerir uma tendência inicial para um acúmulo maior de gordura na região do tronco, sendo este um indicador futuro risco cardíaco.

Palavras-chave: avaliação, composição corporal, pré-escolares.